



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,751	02/23/2004	Timothy Daniel Kostar	13DV-14085 (07783-0113)	2241
31450 7590 01/08/2009 MCNEES WALLACE & NURICK LLC 100 PINE STREET P.O. BOX 1166 HARRISBURG, PA 17108-1166				
EXAMINER				
MATZEK, MATTHEW D				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
01/08/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/784,751

Applicant(s)

KOSTAR ET AL.

Examiner

MATTHEW D. MATZEK

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,8-20 and 28-31 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,3-5,8-20 and 28-31 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/27/2008 has been entered.

Response to Arguments

2. Applicant's arguments, see Remarks, filed 10/27/2008, with respect to the rejection(s) of claim(s) 1, 3-5, 8-20 and 28-31 in view of Tani, Hillig and additional reference have been fully considered and are persuasive. Therefore, all previous rejections have been withdrawn. However, upon further consideration, new grounds are set forth below.

Response to Amendment

3. The amendment dated 10/27/2008 has been fully considered and entered into the Record. Claims 1 and 28 are amended, but contain no new matter. Claims 1, 3-5, 8-20 and 28-31 remain pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 is improperly dependent upon cancelled claim 2. Examiner has interpreted the claim to be dependent from independent claim 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4, 5, 8-11, 15 and 28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Singh et al. (US 5,407,734).

a. Singh et al. disclose a ceramic matrix composite laminate (abstract) comprising a plurality of preform lamina, each comprising directional continuous ceramic filaments in said matrix (col. 7, line 66-col. 8, line 23). The composite is formed with the application of compression and heat (Example 1) and the interface between adjacent lamina has been substantially removed (col. 7, lines 66-68). In between each lamina is a ceramic matrix layer with up to 50% by volume ceramic whiskers (col. 8, lines 10-13). Examiner has equated the whiskers of Singh et al. to the claimed chopped fibers as the whiskers have a length that anticipates the claimed chopped fiber length (col. 3, lines 45-58). The chopped fiber and matrix composition is applied to each lamina to form a tape. Each tape has a thickness ranging from 0.001 to 0.052 inches (col. 4, lines 64-69). The chopped fibers of Singh et al. are randomly oriented as they are admixed in with a liquid medium to form a slurry (col. 4, lines 27-32). The chopped fibers of Singh et al are generally less than about 0.0004 inches in diameter (col. 3, lines 45-52). SiC chopped fibers are used in Example 2.

b. Singh et al. fail to explicitly call the chopped fibers in the chopped fiber/matrix layer a nonwoven mat. Examiner takes the position that since the chopped fibers may comprise up to half of the volume of said chopped fiber/matrix layer there would be enough chopped fibers present and interacting with one another that they would constitute a nonwoven mat of chopped fibers.

c. Claims 8-10 are rejected as the composite of Singh et al. most preferably contains no voids (col. 8, lines 28-38), therefore the number, size and volume fraction of the inter-laminar voids have been reduced to zero. The structure and composition of claim 11 is anticipated by Singh et al. and as such the inter-laminar void limitations of claim 11 would necessarily be met.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 3, 12-14, 17-20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al. (US 5,407,734).

a. Singh et al. disclose a ceramic matrix composite laminate (abstract) comprising a plurality of preform lamina, each comprising directional continuous ceramic filaments in said matrix (col. 7, line 66-col. 8, line 23). The composite is formed the application of compression and heat (Example 1) and the interface between adjacent lamina has been substantially removed (col. 7, lines 66-68). In between each lamina is a ceramic matrix layer with up to 50% by volume ceramic whiskers (col. 8, lines 10-13). Examiner has equated the whiskers of Singh et al. to the claimed chopped fibers as the whiskers have a

length that anticipates the claimed chopped fiber length (col. 3, lines 45-58). The chopped fiber and matrix composition is applied to each lamina to form a tape. Each tape has a thickness ranging from 0.001 to 0.052 inches (col. 4, lines 64-69). Singh et al. fail to explicitly disclose a thickness for the matrix/chopped fiber layer. Taking into consideration that Singh et al. teaches a tape layer (single lamina) comprising a matrix/chopped fiber layer and directional continuous ceramic filament layer it would have been obvious to one of ordinary skill in the art to have arrived at thickness recited in claim 3, especially in light of Singh et al.'s motivation to minimize the thickness of the matrix/chopped layer (col. 60-68). The chopped fibers of Singh et al. are randomly oriented as they are admixed in with a liquid medium to form a slurry (col. 4, lines 27-32). The chopped fibers of Singh et al are generally less than about 0.0004 inches in diameter (col. 3, lines 45-52). It would have been obvious to one of ordinary skill in the art to have optimized the diameter of the chopped fibers to arrive at the claimed diameters with the motivation of using fibers that provide structural reinforcement and separation between the adjacent continuous filaments. SiC chopped fibers are used in Example 2.

b. Singh et al. fail to teach or suggest a porosity percentage of the chopped fiber (whisker) layer. The reference does teach that there is sufficient spacing between the chopped fibers (col. 2, line 65-col. 3, line 6) to permit ceramic matrix penetration and said spacing is dependent upon the size of the ceramic particulate and the particular composite desired. Therefore, the percentage of the chopped fiber layer is a result-effective variable affecting the final properties of the composite (col. 3, lines 1-6).

Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed ratio, it would have been obvious to one of ordinary skill in the art to optimize this result-effective variable by routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

c. Singh et al. disclose a number of different types and their combination of ceramic filaments and whiskers for use in the construction of the ceramic matrix composite laminate (col. 2, lines 32-48). It would have been obvious to one of ordinary skill in the art to have selected the same or different ceramics for the filaments and whiskers as well as combination of different types of ceramic in the same filament or whisker layer. The skilled artisan would have been motivated to pick the particular composition(s) by the desired final properties of the composite, which are determined by each fiber's coefficient of thermal expansion, tensile strength, elastic modulus, etc. It also would have been obvious to one of ordinary skill in the art to have interposed a plurality of chopped fiber nonwoven layers between adjacent preform lamina with the desire to prevent adjacent lamina contact and reduce inter-laminar shear (col. 8, lines 5-10).

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singh et al. (5,407,734) as applied to claim 1 above, and further in view of Singh et al. (US 5,051,301).

'734 discloses the claimed invention except that zircon instead of SiC as the ceramic matrix material. '301 shows that SiC is an equivalent structure known in the art (claim 10). Therefore, because these two ceramic matrix materials were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute zircon for SiC in the invention of '301.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW D. MATZEK whose telephone number is (571)272-2423. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571.272.1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew D Matzek/
Examiner, Art Unit 1794